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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,791	08/17/2001	Mark E. Patton	BW-DKT01010	5440
32175	7590	04/27/2004	EXAMINER	
BORGWARNER INC. POWERTRAIN TECHNICAL CENTER 3800 AUTOMATION AVENUE, SUITE 100 AUBURN HILLS, MI 48326-1782			PAIK, STEVE S	
			ART UNIT	PAPER NUMBER
			2876	

DATE MAILED: 04/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,791	PATTON, MARK E.	
	Examiner	Art Unit	
	Steven S. Paik	2876	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 29 January 2004.

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-35 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) 31-35 is/are allowed.

6) ☒ Claim(s) 1, 10-12, 14, 15, 17, 19, 20, 24, 27 and 29 is/are rejected.

7) ☒ Claim(s) 2-9, 13, 16, 18, 21-23, 25, 26, 28 and 30 is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 17 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
Paper No(s)/Mail Date _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Response to Amendment

1. Receipt is acknowledged of the Amendment filed January 29, 2004. The Amendment includes an amended claim 17 and newly added claims 31-35.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 10-12, 14, 15, 17, 19, 20, 24, 27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Leib (USPN 5,414,513).

Re claims 1, 14, 15, and 17, Leib discloses a method for inspecting a workpiece (printed circuit boards 11) comprising a plurality of parts (elements such as 32 and 34), comprising the steps of:

- a) moving the workpiece (11) relative to a scanning engine (col. 8, ll. 10-34);
- b) detecting a line image across the workpiece (11) with the scanning engine (col. 4, ll. 48-60) producing a signal output representative of the line image (the readout lines 38, 40 and 42 permit readout of electrical signals from the detectors, indicative of fringe lines);
- c) deriving a processed signal (the signals would undergo an A/D conversion process) from the signal output of the scanning engine);
- d) comparing the processed signal to a reference (col. 1, ll. 56+) representing a workpiece without missing parts (a standard reference board);

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e) indicating if the processed signal does not match the reference (the difference identifies the missing part(s) as well as its location).

Regarding claims 10-12, Leib discloses the method as discussed in rejected claim 1 stated above, in which the step of deriving a processed signal comprises converting the signal output of the barcode reader into a number (Figs. 5A-5E shows numeric and graphical representation of a scanned printed circuit board. Each scanned printed circuit board with a unique numeral and graphical results will be compared with a standard printed circuit board having a reference number).

Re claims 19, 20, 24, and 29, Leib discloses a method for inspecting a workpiece (printed circuit board 11) comprising a plurality of parts (circuit elements), comprising the steps of:

- a) a light source (laser assembly) for illuminating the workpiece (11);
- b) a light sensitive array (detector array) for detecting a line image of the workpiece, produced by said light source (both the light source and the light sensitive array are located upper side of the printed circuit board), having a signal output representative of the detected line image (Fig. 5A-5E); and
- c) a signal processing circuit (Fig. 13) having an input coupled to the signal output of the light sensitive array (From detector array 72), and an output, such that the signal output of the light sensitive array is compared to a reference signal (a standard printed circuit board) representative of a complete workpiece without missing parts, and the output of the signal processing circuit producing a signal when the comparison indicates a part is missing (col. 1, ll. 57+).

Regarding claim 27, Leib discloses the method as discussed in rejected claim 19 stated

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above, wherein the signal processing circuit counts a number of level transition in the signal output of the light sensitive array, and the reference is a preset value (Figs. 5A-5E shows numeric and graphical representation of a scanned printed circuit board. Each scanned printed circuit board with a unique numeral and graphical results will be compared with a standard printed circuit board having a reference number).

Allowable Subject Matter

4. Claims 31-35 are allowed.
5. Claims 2-9, 13, 16, 18, 21-23, 25, 26, 28, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the cited prior arts of record do not show the claimed method and a system for detecting a missing part of a workpiece comprising, among other things, a binary number in which each bit representing a detection or non-detection part and the workpiece being moved in a start-stop motion relative to a reader and the line image is detected while the workpiece is stationary. The missing part detecting system further comprises a light source that is located behind the workpiece, such that the light from the light source silhouettes the workpiece, and the line image is detected by light blocked by parts or passed where there are not parts. Furthermore, the method includes a signal processing circuit utilizing mathematical integration of an output signal from a light sensitive array and calculating an area under a measured output curve, and the reference being a voltage. Furthermore, newly added claims 31-35 incorporate allowable subject matters indicated by previous Office Actions.

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Response to Arguments

6. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

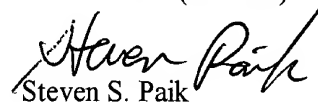
The examiner updated prior art search and applied a new prior art which discloses, teaches, or fairly suggests the claimed invention as discussed above. Accordingly, claims 1, 10-12, 14, 15, 17, 19, 20, 24, 27 and 29 are rejected under 35 U.S.C. § 102 (b).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven S. Paik whose telephone number is 571-272-2404. The examiner can normally be reached on Mon - Fri (5:30am-2:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 571-272-2398. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Steven S. Paik
Examiner
Art Unit 2876

ssp